* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image display approach and equipment which output an image display signal to a display and display an image.
[0002]
[Description of the Prior Art] The image display system which connected the image display control section and the display through the digital interface is known. In such an image display system, the command data which transmit image data from an image display control section through this digital interface to a display, and require various actuation from a display with this from a display and control section are also transmitted through this interface.
[0003]
[Problem(s) to be Solved by the Invention] In such a configuration, even if an error occurs during transmission of image data at the image data Although it is so much satisfactory since all image data is refreshed and is updated at the time of transmission of the following image data, in the case of command data For example, since it is only sent only once when there is modification, when a certain demand occurs, when an error occurs at the time of transmission of that command data, actuation of this whole image display system will be affected.
[0004] This invention was made in view of the above-mentioned conventional example, and aims at offering the image display approach and equipment which enabled it to detect the transmission error in the large command data of the effect by error.
[0005] Moreover, the purpose of this invention is by detecting the transmission error of command data, and making the command data which the error generated resend, or making it restore automatically to offer the image display approach and equipment which raised the dependability at the time of transmission of command data.
[0006] Moreover, the purpose of this invention is to offer the image display approach and equipment which make image data and command data identifiable and can transmit them, without adding a special timing signal.
[0007]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the image display device of this invention is equipped with the following configurations. Namely, the transmitting means which is the image display control device which outputs a picture signal to a display and displays an image, and carries out multiple-times transmission of the same command data to said display, A receiving means to receive the command data transmitted by said transmitting means by said display, A comparison means to compare the command data received by said receiving means, It is characterized by having a storage means to memorize the command data which were in agreement with the comparison by said comparison means, and a resending demand means to require resending of the command data of an inequality by the comparison by said comparison means.
[0008] In order to attain the above-mentioned purpose, the image display device of this invention is equipped with the following configurations. It is the image display control device which outputs a picture signal to a display and displays an image, and said display is received in the same command data. Namely, three or more transmitting means to transmit odd times, A receiving means to receive

the command data transmitted by said transmitting means by said display, It is characterized by having a comparison means to compare the command data received with said receiving means, and a decision means to determine the command data whose large number corresponded by the comparison by said comparison means as command data.

[0009] In order to attain the above-mentioned purpose, the image display approach of this invention is equipped with the following processes. It is the image display control approach which outputs a picture signal to a display and displays an image, and said display is received in the same command data. Namely, three or more transmitting processes transmitted odd times, The receiving process which receives the command data transmitted according to said transmitting process by said display, It is characterized by having the comparison process which compares the command data received at said receiving process, and the decision process which determines the command data whose large number corresponded by the comparison by said comparison process as command data.

[0010] In order to attain the above-mentioned purpose, the image display approach of this invention is equipped with the following processes. Namely, the transmitting process which is the image display control approach which outputs a picture signal to a display and displays an image, and transmits the command data to said display, The receiving process which receives the command data transmitted at said transmitting process by said display, The comparison process which compares the return process which returns the command data received at said receiving process with the command data returned at said return process and the command data transmitted at said transmitting process, It is characterized by having the resending process which resends said command data to said display by the comparison by said comparison process in the case of an inequality.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained to a detail with reference to an accompanying drawing.

[0012] [Gestalt 1 of operation] drawing 1 is the block diagram showing the image display structure of a system concerning the gestalt 1 of operation of this invention, and this display system receives and processes a video signal, receives the control section 100 which outputs a picture signal [finishing / that processing] to a display 200, and the picture signal sent from this control section 100, and displays an image, for example, has the displays 200, such as a flat-surface mold display.

[0013] The configuration of a control section 100 is explained first. 101 is CPU which controls actuation of a control section 100, and is performing various control processings according to the control program memorized by program memory 101a. 102 is a remote control receive section, it receives the infrared light from the remote control (un-illustrating) operated by the operator, extracts the data contained in the infrared light, and outputs them to CPU101. Thereby, CPU101 analyzes the data (decoding) and is controlling the digital-image-processing section 103, the digital interface (I/F) transmitting section 105, etc. according to the analysis result. 104 is a look-up table and has memorized the various data referred to in the case of the image processing in the digital-image-processing section 103. In addition, expansion interpolation, the contraction function, the calculation function for image quality adjustment, etc. are contained in the image processing in this digital-image-processing section 103. The digital interface (I/F) transmitting section 105 has also transmitted the command data according to the analysis result of the remote control data in CPU101 to the display 200 while transmitting the picture signal processed in the digital-image-processing section 103 to a display 200 with the synchronizing signal.

[0014] In addition, as a video signal to input, TV signals, such as NTSC, or any of digital signals, such as RGB, is sufficient, and two or more input networks of a video signal may be prepared not only in one.

[0015] Next, the configuration of a display 200 is explained.

[0016] 201 is CPU and is controlling actuation of the display 200 whole. This CPU201 is equipped with memory 201b which memorizes program memory 201a which memorizes the program executed by CPU201, the command data received further. 202 is a display panel and is the display panel of the flat-surface mold which has a face plate equipped with the fluorescent substance which emits light with the gestalt of this operation with the electron emission component arranged, for example in the shape of a matrix, and the electron emitted from these electron emission component. 203 is Y driver and drives wiring (line wiring) of the direction of the scanning line of a display panel

202. 204 is X driver and is driving train wiring of a display panel 202 according to the image data for 1 horizontal-scanning Rhine memorized by the Rhine memory 205. a picture signal, a command, a synchronizing signal, etc. which 206 is a digital interface (I/F) receive section, and are sent from the digital interface transmitting section 105 of a control section 100 -- receiving -- for example, a command and a synchronizing signal -- CPU201 -- moreover, the Y driver 203 is driven according to a synchronizing signal, and the picture signal is further outputted and stored in the Rhine memory 206. In addition, Rhine which connects the digital interface transmitting section 105 and a receive section 206 is a digital interface dedicated line, and a command and a picture signal are transmitted as parallel or serial data. Moreover, adjustment values, such as image quality set up by remote control actuation by the user, and brightness, contrast, etc. are memorized by memory 201b (un-volatilizing) of the memory (un-volatilizing) which is not illustrated [of CPU101 of a control section 100], and CPU201 of a display 200, respectively.

[0017] [Gestalt 1 of operation] drawing 2 is the block diagram showing the configuration of the transmission error detecting circuit of the digital interface receive section 206 of the display 200 of the gestalt 1 of this operation, and drawing 3 is a timing chart explaining the signal timing. In addition, a command shall be continuously sent twice here synchronizing with a clock signal and a synchronizing signal (SYNC).

[0018] As for the interface cable for a communication link, and 21, in drawing 2 , 11 and 12 are [a differential receiver and 22] differential signal transmitters. For 31 and 32, as for an EXOR (exclusive OR) circuit and 42, a D type flip-flop (D-F/F) and 41 are [an AND circuit and 43] OR circuits. In the interface cable 11 for a communication link, it has the signal line including a 24-bit data signal (DATA 00-23), and a clock (CLK), and the horizontal and Vertical Synchronizing signal of a picture signal (sync) here.

[0019] A Horizontal Synchronizing signal (H-SYNC) is usually a low level, and is a signal which becomes high-level only at the head of command data here. And the image data for one horizontal scanning (Rhine) is transmitted following this command data. In addition, this command data is transmitted to a display 200, only when a demand occurs from a control section 100.

[0020] in addition, drawing 2 -- setting -- D-F/F -- although each of 31, 32, the EXOR circuit 41, AND circuit 42, and OR circuit 43 is shown as one circuit, it is prepared for the 24 numbers of bits "24" in all of data with the gestalt of this operation.

[0021] In the above configuration, the data received with the receiver 21 are inputted and latched to D-F/F31 while they are inputted into one input terminal of the EXOR circuit 41, they are delayed by one clock, and are inputted into the input terminal of another side of the EXOR circuit 41. Thereby, the EXOR circuit 41 searches for the exclusive OR of two data (DATA 00-23) which followed time series, a synchronizing signal (SYNC) and a synchronization are taken by AND circuit 42, and the output is outputted to OR circuit 43. By this, if at least 1 bit of OR circuit 43 of two data (DATA 00-23) which followed time series does not correspond, it will output a "high-level" signal to CPU201. Moreover, it notifies that could come, simultaneously the transmission error occurred in the control section 100 through the transmitter 22. Thereby, a control section 100 performs processing of resending the command data, for example.

[0022] In addition, the most significant bit (DATA23) of this command data is made into the bit for judging whether it is resending data, and you may make it judge whether it is resending data by the display 200 in transmission of the command data from a control section 100 to a display 200. Furthermore, this resent data is compared with two data which the last error generated, and you may make it judge the congruous ones to be right command data in a display 200.

[0023] [Gestalt 2 of operation] drawing 4 is the block diagram showing the configuration of the transmission error detecting circuit of the digital interface receive section 206 of the display 200 of the gestalt 2 of this operation, and the timing chart where drawing 5 explains the signal timing, and drawing 6 are drawings showing the logical-value table showing the condition of the signal. In addition, a command shall be continuously sent 3 times here synchronizing with a clock signal and a Horizontal Synchronizing signal (H-SYNC). In addition, in drawing 3 , the same number shows the part which is common in above-mentioned drawing 2 , and it omits those explanation.

[0024] 5 is the command data correction section and has two AND circuits 51 and 53 and two EXOR circuits 52 and 54. In addition, although each of these EXOR(s) circuits 52 and 54 and AND

circuits 51 and 53 is shown as one circuit, it is prepared for the 24 numbers of bits "24" in all of data with the gestalt of this operation.

[0025] With the gestalt 2 of this operation, as shown in the timing chart of drawing 5 , command data are continuously transmitted by three clocks from the time of a Horizontal Synchronizing signal (H-SYNC) becoming high-level. These three continuous command data are delayed by one clock by D-F/F 31 and 32, respectively, and are outputted as b (1 clock delay) and c (2 clock delay). Moreover, a shows data without delay.

[0026] Even when the truth value data of drawing 6 were referred to and three continuous data differ so that clearly, the command data which were [of them] in agreement twice are outputted from the EXOR circuit 54.

[0027] Therefore, CPU201 can read the data which were in agreement twice [at least] of 3 times of the data by inputting the data from the command data correction section 5 after 2 clocks, after receiving a Horizontal Synchronizing signal (H-SYNC). Command data reliable thereby more are receivable.

[0028] In addition, with the gestalten 1 and 2 of the above-mentioned operation, although hardware is performing detection and error amendment of an error, this invention is not limited to this and software may perform it.

[0029] Drawing 7 shows the flow chart at the time of realizing actuation concerning the gestalt 1 of the above-mentioned operation by the program, and drawing 8 shows the case where actuation concerning the gestalt 2 of operation is performed by the program. The program which performs these processings in the case of which is memorized by program memory 201a of CPU201.

[0030] In drawing 7 , the 1st command data is memorized to the memory area 1 of memory 201b between two continuous commands (S1, S2), and the 2nd command data is memorized to the memory area 2 of memory 201b (S3, S4). At step S5, it investigates whether these two command data are in agreement, and if in agreement, the command data will judge it as a right thing, and will progress to step S6, and the command data stored will be performed.

[0031] On the other hand, if it is judged that it is not in agreement at step S5, it will progress to step S7 and resending will be required from a control section 100.

[0032] Moreover, in drawing 8 , the 1st command data is memorized to the memory area 1 of memory 201b among three continuous commands (S11, S12), and the 2nd command data is memorized to the memory area 2 of memory 201b (S13, S14). At step S15, it investigates whether these two command data are in agreement, and if in agreement, the command data will judge it as a right thing, will progress to step S16, and will perform the command data stored in the memory area 1 or 2.

[0033] When not in agreement at step S15, it progresses to step S17, and the 3rd command data is memorized to the memory area 3 of memory 201b (S17, S18). At step S19, it investigates whether two command data memorized by these memory areas 1 and 3 are in agreement, and if in agreement, the command data will judge it as a right thing, will progress to step S21, and will perform the command data stored in the memory area 3. Moreover, when the data of memory areas 1 and 3 are not in agreement, it progresses to step S20, it investigates whether two command data memorized by these memory areas 2 and 3 are in agreement, and if in agreement, the command data will judge it as a right thing, and will progress to step S21, and the command data stored in the memory area 3 are performed.

[0034] On the other hand, at step S20, if it is judged that it is in agreement with neither of the values of the memory areas, since it is inharmonious, each of three received data will progress to step S22, and resending of command data will be required from a control section 100.

[0035] Moreover, although two continuous data are compared and it has judged whether it is an error with the gestalt 1 of the above-mentioned operation, you may be more than this. Moreover, in the gestalt 2 of operation, 3 times of things are [that not to restrict but what is necessary is just odd times beyond this] similarly natural.

[0036] Moreover, although the gestalt of the above-mentioned operation is comparing for every bit, you may be all bit packages or a cutting tool unit.

[0037] Moreover, in the gestalt 2 of the above-mentioned operation, when the result of majority is not obtained, the resending demand of the command data may be transmitted to a control section

100 like the gestalt 1 of the above-mentioned operation.
[0038] Moreover, you may make it return a control section 100 unconditionally from a display 200 in the gestalten 1 and 2 of the above-mentioned operation, so that a control section 100 can check the command data received by the display 200. In this case, a control section 100 checks that returned command data, and when the bottom command data of transmission and the returned command data are not in agreement, it judges it that command data need to be retransmitted a message, and you may make it resend it.
[0039] the case where according to the gestalt of the above-mentioned operation carry out multiple-times transmission of the command data from a control section continuously to a display, and the display which received this compares each command data as explained above, and it is not in agreement even once -- a control section -- a resending demand -- issue, by things, the effect by the transmission error of command data is lost, and malfunction can be prevented.
[0040] Moreover, it is effective in the ability to lose sharply malfunction of the display accompanying generating of the transmission error of command data by transmitting command data to a display continuously odd times from a control section, taking the majority and judging as right receiving command data by the display which received it.
[0041] [Gestalt 3 which is operation] An above-mentioned control section 100 and an above-mentioned display 200 explain below how to transmit command data (following, system control data) from a control section 100 to a display 200, in the configuration connected through the digital interface. In addition, the digital interfaces in this case may be the above parallel-data transfers, or any of a serial data transfer are sufficient as them.
[0042] Drawing 9 is the functional block diagram showing the functional configuration of the display concerning the gestalt 3 of operation of this invention thru/or 10.
[0043] In drawing, 901 is the mode detection section, judges whether they are the image data mode whose data received from a control section 100 based on a horizontal and the period of a Vertical Synchronizing signal, pulse width, signal level, its duty ratio, etc. are a picture signal, and the system control data mode which receives system control data, and notifies the result to CPU201. 902 is the drawing processing section and is controlled to drive and display a display panel 202 based on image data, a horizontal and a Vertical Synchronizing signal, and a clock signal. 903 is the control data processing section, it checks for no error the control data received by the system control data mode, the optimal control data is chosen by majority etc. as mentioned above, or gains right control data using well-known error detection, a well-known correction function, etc., and memorizes it in the control data storage section 904. The comparison of two or more data is sufficient as this error detection as mentioned above, or it may use parity, a sum check, etc., for example. This control data storage section 904 has memorized the system control data from the control data processing section 903 un-volatilizing. Moreover, CPU201 directs resending of system control data to a control section 100 through a return line 905, when various control parameters etc. are determined or the control data processing section 903 detects [**** / outputting directions of drawing processing to the drawing processing section 902] an error according to the system control data memorized by the control data storage section 904 based on the detection result of the mode detection section 901.
[0044] Drawing 10 (A) and (B) are the timing charts explaining actuation concerning the gestalt 3 of operation of this invention.
[0045] Drawing 10 (A) shows the transmission mode of image data, and drawing 10 (B) shows the transmission mode of system control data. Thus, the period of a Horizontal Synchronizing signal is made into abbreviation one half in the transmission mode of system control data. In this case, the mode detection section 901 investigates the period of this Horizontal Synchronizing signal, when that period becomes abbreviation half [of the usual period], judges it to be the transmission mode of system control data, notifies it to CPU201, it is processed in the control data processing section 903 by making into system control data the data then received, and is memorized in the control data storage section 904.
[0046] Moreover, a predetermined period halt of the output of a Horizontal Synchronizing signal is carried out, and after telling performing the switch to the transmission mode of system control data of image data from a transmission mode, the period of a Horizontal Synchronizing signal is changed and you may make it transmit system control data synchronizing with the Horizontal Synchronizing

signal, as shown in drawing 11 .
[0047] Moreover, when parity, a sum check, etc. perform error detection in the control data processing section 903 and an error is detected as mentioned above for example, since such system control data has a possibility of affecting actuation of a display 200 when a transmitting error etc. is received by the display 200 as data which generated and were mistaken, it directs to an error correction or CPU201, and may be made to carry out a resending demand etc. to a control section 100. Moreover, by whether as mentioned above, multiple-times continuation is carried out, the same system control data is transmitted, and they are in agreement by the receiving side, it may judge whether it is an error and a resending demand etc. may be published.
[0048] Drawing 12 shows the case where the resending demand signal is being outputted to the timing of the following data (D1), when the system control data same by a unit of 2 times is transmitted to a display 200 from a control section 100 and they are not in agreement (drawing 12 C1!= C2). In addition, although these error checking and the explanation about error resending are omitted with the gestalt of the following operations, of course also in the gestalt of these operations, error checking, resending directions, etc. are performed like the gestalt 3 of this operation, or the gestalt of the above-mentioned operation. In addition, the transfer clock in the case of transmitting control data may be made into a frequency lower than the frequency of the transfer clock in the case of transmitting image data. Thereby, the incidence rate of the error at the time of a transfer of control data can be lowered.
[0049] [Gestalt 4 of operation] drawing 13 (A) and (B) are the timing charts showing actuation concerning the gestalt 4 of operation of this invention.
[0050] Drawing 13 (A) shows the transmission timing of the image data in the image data mode, and drawing 13 (B) shows the transmission timing of the system control data in the system control data mode.
[0051] Thus, with the gestalt 4 of this operation, the image data mode and the system control data mode are distinguished by changing the period of a Vertical Synchronizing signal (V-Sync). The check of the Vertical Synchronizing signal in this case is the mode detection section 901, and can be detected by carrying out counting of the number of the Horizontal Synchronizing signals which measure the time amount to the following Vertical Synchronizing signal, or are generated between Vertical Synchronizing signals.
[0052] [Gestalt 5 of operation] drawing 14 (A) and (B) are the timing charts showing actuation concerning the gestalt 5 of operation of this invention.
[0053] Drawing 14 (A) shows the transmission timing of the image data in the image data mode, and drawing 14 (B) shows the transmission timing of the system control data in the system control data mode.
[0054] Thus, with the gestalt 5 of this operation, the flag signal 1400 which shows that it is the system control data mode is inserted in level blanking time amount. Therefore, when the mode detection section 901 detects this flag signal 1400 by level blanking time amount shows that the data received at the next 1 horizontal-scanning period are system control data.
[0055] [Gestalt 6 of operation] drawing 15 (A) and (B) are the timing charts showing actuation concerning the gestalt 6 of operation of this invention.
[0056] Drawing 15 (A) shows the transmission timing of the image data in the image data mode, and drawing 15 (B) shows the transmission timing of the system control data in the system control data mode.
[0057] Thus, with the gestalt 6 of this operation, the flag signal 1500 which shows that it is the system control data mode is inserted in perpendicular blanking time amount. Therefore, when the mode detection section 901 detects this flag signal 1500 to this perpendicular blanking time amount shows that the data received at the next 1 perpendicular period are system control data.
[0058] [Gestalt 7 of operation] drawing 16 (A) and (B) are the timing charts showing actuation concerning the gestalt 7 of operation of this invention.
[0059] Drawing 16 (A) shows the transmission timing of the image data in the image data mode, and drawing 16 (B) shows the transmission timing of the system control data in the system control data mode.
[0060] Thus, with the gestalt 7 of this operation, when the mode detection section 901 detects that a

Horizontal Synchronizing signal is high-level beyond predetermined time shows that the data received at this time are system control data.
[0061] [Gestalt 8 of operation] drawing 17 (A) and (B) are the timing charts showing actuation concerning the gestalt 8 of operation of this invention.
[0062] Drawing 17 (A) shows the transmission timing of the image data in the image data mode, and drawing 17 (B) shows the transmission timing of the system control data in the system control data mode.
[0063] Thus, with the gestalt 8 of this operation, when the mode detection section 901 detects that a Vertical Synchronizing signal is high-level beyond predetermined time shows that the data received at this time are system control data. In addition, in this system control data mode, system control data may be received synchronizing with a Horizontal Synchronizing signal.
[0064] [Gestalt 9 of operation] drawing 18 (A) and (B) are the timing charts showing actuation concerning the gestalt 9 of operation of this invention.
[0065] Drawing 18 (A) shows the transmission timing of the image data in the image data mode, and drawing 18 (B) shows the transmission timing of the system control data in the system control data mode.
[0066] Thus, with the gestalt 9 of this operation, when the mode detection section 901 detects that the pulse width of a Horizontal Synchronizing signal is shorter than the usual Horizontal Synchronizing signal pulse width shows that the data received within this horizontal scanning period are system control data. In addition, the pulse width of the Horizontal Synchronizing signal which shows that it is the system control data mode may be longer than the usual pulse width.
[0067] [Gestalt 10 of operation] drawing 19 (A) and (B) are the timing charts showing actuation concerning the gestalt 10 of operation of this invention.
[0068] Drawing 19 (A) shows the transmission timing of the image data in the image data mode, and drawing 19 (B) shows the transmission timing of the system control data in the system control data mode.
[0069] Thus, with the gestalt 10 of this operation, when the mode detection section 901 detects a ******** rather than Vertical Synchronizing signal pulse width usual in the pulse width of a Vertical Synchronizing signal shows that the data received within this vertical-scanning period are system control data. In addition, the pulse width of the Vertical Synchronizing signal which shows that it is the system control data mode may be a case shorter than the usual pulse width.
[0070] Drawing 20 is a flow chart which shows the processing in the case of performing the outline of the above-mentioned processing with software. Here, it judged, and in being short, it has judged to be the system control data mode whether the period of a Horizontal Synchronizing signal (H-SYNC) is shorter than the usual period. Furthermore, as for this system control data, the same data shall be continuously sent twice from a control section 100.
[0071] At step S31, it finds first whether the following Horizontal Synchronizing signal (H-SYNC) was received within 1000 clocks of a clock signal from the last Horizontal Synchronizing signal (H-SYNC). When having not received, it progresses to step S32, and it sees whether they are less than 1500 clocks from the last synchronizing signal. If that is right, it will be judged as the image data mode and will progress to step S33, and it directs in the drawing processing section 902, and drawing processing is performed.
[0072] On the other hand, at step S32, from the last Horizontal Synchronizing signal (H-SYNC), when it is not less than 1500 clocks, it progresses to step S34, and it judges that it is in pause mode here, and shifts to a sleep mode, and a halt of the electric power supply to an unnecessary part etc. is performed at the time. And it progresses to step S35, it waits to receive a Horizontal Synchronizing signal (H-SYNC) next, and returns to step S31.
[0073] Moreover, it finds whether at step S31, from the last Horizontal Synchronizing signal (H-SYNC), when the following Horizontal Synchronizing signal (H-SYNC) was received within 1000 clocks of a clock signal, it judged that it was the system control data mode, and progressed to step S36, and four or more Horizontal Synchronizing signals (H-SYNC) were inputted. When that is not right, it progresses to step S37, and the preparations for going into the system control data mode are made.
[0074] moreover, the time of inputting four or more pulses at step S36 -- step S38 -- progressing --

the input of system control data -- starting -- the received data -- the 1st -- or the 2nd is judged. If it is the 1st, it will progress to step S40, the 1st data is memorized in the memory A of CPU201, if it is the 2nd, it will progress to step S39, and it memorizes in the memory B of CPU201. And if two data are received, it will progress to step S41, and it obtains whether the value of these memory A and B is in agreement. When in agreement, it progresses to step S43, and the system control data is memorized in the control data storage section 904. Moreover, when not in agreement, it progresses to step S42, and a resending demand is published to a control section 100 by CPU201, and it returns to step S31.

[0075] In addition, although the control section and the display showed with the gestalt of another object in the gestalt of each operation mentioned above, this invention may be the display with which it is not limited to this and the control section and the display were formed in one.

[0076] In the gestalten 3-10 of the [gestalt 11 of operation] operation, although the synchronizing signal performed mode distinction, it is good also as a configuration which distinguishes the mode by changing the frequency of the time of transmitting image data, and the transfer clock when transmitting control data. For example, the frequency of a transfer clock is set to 66MHz at the time of image data transfer mode, and a transfer of control data also sets the frequency of a transfer clock to 33MHz at which time. Thereby, distinction in the mode and the incidence rate of the error at the time of a typed data transfer can be reduced.

[0077] In addition, even if it applies this invention to the system which consists of two or more devices (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the equipments (for example, a copying machine, facsimile apparatus, etc.) which consist of one device.

[0078] Moreover, the purpose of this invention supplies the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and is attained also by carrying out read-out activation of the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage.

[0079] In this case, the function of the operation gestalt which the program code itself read from the storage mentioned above will be realized, and the storage which memorized that program code will constitute this invention.

[0080] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0081] Moreover, by performing the program code which the computer read, a part or all of processing that OS (operating system) which the function of the operation gestalt mentioned above is not only realized, but is working on a computer based on directions of the program code is actual is performed, and also when the function of the operation gestalt mentioned above by the processing is realized, it is contained.

[0082] Furthermore, after the program code read from the storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or the computer is equipped, a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped is actual performs, and also when the function of the operation gestalt mentioned above by the processing is realized, it is contained based on directions of the program code.

[0083] As explained above, according to the gestalt of this operation, the dependability in transmission of command data can be raised.

[0084] Moreover, according to the gestalt of this operation, it is effective in the ability to distinguish, transmit and receive the image data used for a display, and command data (system control data), without adding a special signal.

[0085] Moreover, according to the gestalt of this operation, the transmission error of command data can be detected, the command which the error generated can be made to be able to restore, and the dependability at the time of transmission of command data can be raised.

[0086]

[Effect of the Invention] As explained above, according to this invention, the transmission error in the large command data of the effect by error is detectable.

[0087] Moreover, according to this invention, the transmission error of command data can be detected, the command data which the error generated can be made to be able to resend, and the dependability at the time of transmission of command data can be raised.
[0088] Moreover, according to this invention, it is effective in making image data and command data identifiable and being able to transmit them, without adding a special timing signal.

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CLAIMS

[Claim(s)]
[Claim 1] The transmitting means which is the image display control device which outputs a picture signal to a display and displays an image, and carries out multiple-times transmission of the same command data to said display, A receiving means to receive the command data transmitted by said transmitting means by said display, A comparison means to compare the command data received by said receiving means, The image display control unit characterized by having a storage means to memorize the command data which were in agreement with the comparison by said comparison means, and a resending demand means to require resending of the command data of an inequality by the comparison by said comparison means.
[Claim 2] It is the image display control device which outputs a picture signal to a display and displays an image, and said display is received in the same command data. Three or more transmitting means to transmit odd times, A receiving means to receive the command data transmitted by said transmitting means by said display, The image display control unit characterized by having a comparison means to compare the command data received with said receiving means, and a decision means to determine the command data whose large number corresponded by the comparison by said comparison means as command data.
[Claim 3] Said comparison means is an image display control unit according to claim 1 or 2 characterized by performing the comparison by the bitwise which constitutes said command data.
[Claim 4] Said comparison means is an image display control unit according to claim 2 characterized by performing the comparison by the bitwise which constitutes said command data, and determining said command data by the majority in each bitwise.
[Claim 5] A transmitting means to be the image display control device which outputs a picture signal to a display and displays an image, and to transmit the command data to said display, A receiving means to receive the command data transmitted by said transmitting means by said display, A return means to return the command data received by said receiving means to said transmitting means, A comparison means to compare the command data returned by said return means with the command data transmitted with said transmitting means, The image display control unit characterized by having a resending means to resend said command data to said display with said transmitting means, by the comparison by said comparison means in the case of an inequality.
[Claim 6] Said transmitting means is an image display control unit given in claim 1 characterized by having further a means to transmit the synchronizing signal of a picture signal and said picture signal to said display, specifying whether it is which transmitting mode of said picture signal and said command data with said synchronizing signal, and transmitting thru/or any 1 term of 5.
[Claim 7] Said transmitting means is an image display control unit given in claim 1 characterized by having further a means to transmit a transfer clock to said display, specifying whether it is which transmitting mode of said picture signal and said command data with said transfer clock, and transmitting thru/or any 1 term of 5.
[Claim 8] Said transmitting means is an image display control unit according to claim 6 characterized by specifying said transmitting mode with the pulse width of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 9] Said transmitting means is an image display control unit according to claim 6 characterized by specifying said transmitting mode with the period of the horizontal contained in

said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 10] Said transmitting means is an image display control unit according to claim 6 characterized by specifying said transmitting mode as the horizontal or perpendicular blanking period specified by said synchronizing signal by whether a signal is included or not.
[Claim 11] Said transmitting means is an image display control unit according to claim 6 characterized by specifying said transmitting mode with the signal level of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 12] Said transmitting means is an image display control unit according to claim 6 characterized by specifying said transmitting mode with the duty ratio of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 13] The transmitting process which is the image display control approach which outputs a picture signal to a display and displays an image, and carries out multiple-times transmission of the same command data to said display, The receiving process which receives the command data transmitted at said transmitting process by said display, The comparison process which compares the command data received at said receiving process, The image display control approach characterized by having the process which memorizes in memory the command data which were in agreement with the comparison in said comparison process, and the resending demand process of requiring resending of the command data of an inequality by the comparison by said comparison process.
[Claim 14] It is the image display control approach which outputs a picture signal to a display and displays an image, and said display is received in the same command data. Three or more transmitting processes transmitted odd times, The receiving process which receives the command data transmitted according to said transmitting process by said display, The image display control approach characterized by having the comparison process which compares the command data received at said receiving process, and the decision process which determines the command data whose large number corresponded by the comparison by said comparison process as command data.
[Claim 15] The image display control approach according to claim 13 or 14 characterized by performing the comparison by the bitwise which constitutes said command data from said comparison process.
[Claim 16] The image display control approach according to claim 14 characterized by performing the comparison by the bitwise which constitutes said command data from said comparison process, and determining said command data by the majority in each bitwise.
[Claim 17] The transmitting process which is the image display control approach which outputs a picture signal to a display and displays an image, and transmits the command data to said display, The receiving process which receives the command data transmitted at said transmitting process by said display, The comparison process which compares the return process which returns the command data received at said receiving process with the command data returned at said return process and the command data transmitted at said transmitting process, The image display control approach characterized by having the resending process which resends said command data to said display by the comparison by said comparison process in the case of an inequality.
[Claim 18] The image display control approach given in claim 13 further characterized by having the process which transmits the synchronizing signal of a picture signal and said picture signal to said display, specifying whether it is which transmitting mode of said picture signal and said command data with said synchronizing signal, and transmitting at said transmitting process thru/or any 1 term of 17.
[Claim 19] The image display control approach according to claim 18 characterized by specifying said transmitting mode at said transmitting process with the pulse width of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 20] The image display control approach according to claim 18 characterized by specifying said transmitting mode at said transmitting process with the period of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 21] The image display control approach according to claim 18 characterized by specifying said transmitting mode by whether a signal is included at the horizontal or perpendicular blanking period specified by said synchronizing signal at said transmitting process.
[Claim 22] The image display control approach according to claim 18 characterized by specifying

said transmitting mode at said transmitting process with the signal level of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 23] The image display control approach according to claim 18 characterized by specifying said transmitting mode at said transmitting process with the duty ratio of the horizontal contained in said synchronizing signal, or a Vertical Synchronizing signal.
[Claim 24] The image display control approach given in claim 13 further characterized by having the process which transmits a transfer clock to said display, specifying whether it is which transmitting mode of said picture signal and said command data with said transfer clock, and transmitting at said transmitting process thru/or any 1 term of 17.

[Translation done.]